Location ID: BLM-7-509 Field Representative(s): Cooper/Egan

Northing: 224244.56 Easting: 402952.81

Date Started: 27 April 1988 Date Completed: 17 May 1988

Drilling Method: Air-foam rotary Drilling Contractor: Larjon

Driller: J. Gower

Total Depth Borehole: 557' Total Depth Well Casing: 528.19'

Total Depth Surface Casing: 101'

Diameter Well Casing: 4" Diameter Surface Casing: 10"

Length of Bottom Blank: 5'

Type of Screen: 10' extra strength 0.02 slot

Screen Interval: 509.3' to 519.7'

Water First Detected: 525' Water Level Open Borehole: 462'

Water Level Cased Borehole: 458.8'

Quik-Foam Use: 10 gallons foam and 5 gallons EZ-Mud

Estimated Water Use: 11,050 gallons used during drilling
5,395 gallons recirculated
5,655 gallons introduced to borehole

Well Casing:

4in x 3ft SCD 40 PVC:		stock SS centralizers:	
4in x 5ft SCD 40 PVC:		custom SS centralizers:	1
4in x 10ft SCD 40 PVC:		4"x2' SS locking riser:	1
4in x 20ft SCD 40 PVC:		4" SS locking cap:	1
Total SCD 40 PVC pipe:	ft	4" SS female cap:	1
4in x 3ft SCD 5 SS pipe:	2		
4in x 5ft SCD 5 SS pipe:	1	4in x 5ft SCD 10 SS pipe:	1
4in x 10ft SCD 5 SS pipe:	1	4in x 10ft SCD 10 SS pipe:	1
4in x 20ft SCD 5 SS pipe:	19	4in x 20ft SCD 10 SS pipe:	5
Total SCD 5 SS pipe:	401 ft	Total SCD 10 SS pipe:	115 ft

Well Completion:

100# bags 16/40 sand:	5	bags
100# bags 10/20 sand:	13	bags
100# bags 8/14 sand:	2	bags
100# bags 8/20 sand:	12	bags
94# bags cement:	105	bags
5 gal. buckets bentonite:	5	buckets
50# bentonite powder:	10	bags

Surface Casing:

94# bags cement:	70	bags
50# bags bentonite powder:	7	bags

Pertinent Field Notes:

4/26/88 Steam clean rig and take to well site.

4/27/88 Steam clean drill pipe and bits. Spud well with 8 3/4" bit. Drill 100' with drillograph and collect samples. Ream with 14 3/4" bit ~ 11'. Very bouldery, slow reaming. 1650 gallons water used. Cooper

4/28/88 Water sampled by Lockheed. Ream hole 14 3/4" bit from 11'-80'. Ran out of water, stop for day. 1800 gallons water used. Cooper

4/29/88 Load cement for grouting surface casing. Second water truck brought to site. Ream with 14 3/4" bit from 80'-107'. Set and grout surface casing. 70 bags cement. Seven bags gel. 1100 gallons water used during drilling. Egan, Cooper

4/30/88 Drilled from 106'-248' 9 7/8" bit. Blew a hydraulic line on CP unit. Drilling ceased for day. Hydraulic fluid spill on ground and some drained into annulus between surface casing and borehole wall (~ 2 gal. ?). 1250 gallons water used. Cooper, Egan

5/1/88 Drilled with 9 7/8" bit from 247'-405'. Monitored main compressor with filter at 251'-290'. Monitored auxiliary compressor with filter at 290'-330'. Stopped for day when water ran out. 1750 gallons of water used. Cooper, Egan

5/2/88 Drilled with 9 7/8" bit from 405'-425'. Bit caught in hole at ~ 420'. 1600 gallons water used. Blowing at 420' to free the bit ruptured the bore wall. To maintain borehole stability and prevent cuttings from getting caught in this rupture, a "stiffer" foam will be used for drilling beginning 5/3/88 and until TD is reached. A "stiffer" foam is achieved by adding 2.5 gallons EZ-Mud to 1200 gallons water with 1/2 gallon foam. The auxiliary

	air compressor is not used, and air pressure is maintained at 500 cfm. Too much pressure will rupture the stiff foam column and defeat the purpose of lifting all cuttings. Cooper, Egan
5/3/88	Drilled with 9 7/8" bit from 425' to TD (557'). Experienced significant sloughing (mostly coarse sand) to TD. First signs of water at - 525'. 1900 gallons water used. Cooper, Egan
5/4/88	Loaded inventory for BLM-7. Southwest Surveys ran geophysical logs of the borehole. Bailed and sampled open borehole (sample # 8805031544). Tripped in tremie pipe. Cooper, Egan
5/5/88	Installed bottom bentonite pellet plug, 16/40 sand and 4" x 528.19' SS casing. Add 8/20 gravel pack around screen. Switch to a smaller bailer because drift of hole inhibits large bailer from getting past 380' (static at 462'). Cooper, Egan
5/6/88	Bail well with 2" x 10' bailer to set gravel pack. Install partial upper bentonite plug until bridge forms at 454'. Worked tremie through plug using air to jet through. Top of plug at 497.4'. Tremie - 7' above surface casing while adding filler sand. Approximately 12' of filler sand added before tremie slipped and fell 40'. Tremie dropped from 462' to 502'. Top of 16/40 sand is 501.4'. Tremie is 0.6' into 16/40 sand. Cooper
5/7/88	Fish out 294' tremie pipe, 168' of tremie still in well. Cooper
5/10/88	Pumped BLM-7 to confirm no upper plug or screen damage by lost tremie. Mix cement. Cooper
5/11/88	Grouted to surface. Cooper
5/13/88	Developed well by pump only, no bailer. Total gallons pumped is - 799. See well development sheet for details. Egan, Kaszuba
5/17/88	Poured concrete pad and set brass cap at well site. Egan